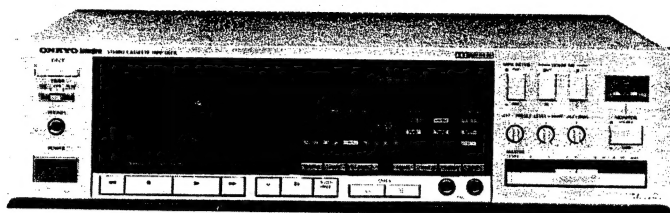


# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK MODEL TA-2500



Black and silver models

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

Track Format:	4 tracks, 2 channels
Erasing System:	AC erase
Tape Speed:	4.8cm/sec. (1-7/8 i.p.s.)
Wow & Flutter:	0.045%(WRMS)
Frequency Response:	20-17,000Hz(30-16,000Hz $\pm$ 3dB) (normal position tape) 20-18,000Hz (30-17,000Hz $\pm$ 3dB) (high position tape) 20-19,000Hz (30-18,000Hz $\pm$ 3dB) (metal position tape)
Signal-to-Noise Ratio:	60 dB (metal position tape, Dolby NR out) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B NR. A noise reduction of 20 dB at 5 kHz is possible with Dolby C NR.
Input Jacks:	Mic Jacks: 2 Input Sensitivity: 0.3mV/600 ohms Input impedance: 5.6 kohms Line IN: 2 Input Sensitivity: 60mV Input impedance: 50 kohms
Outputs:	Line Out: 2 Std. output level: 500mV(0dB) Opt load impedance: over 50 kohms Headphone Jack: 1 Opt load impedance: 8-200 ohms

**ONKYO**  
AUDIO COMPONENTS

Motors:	DC servo motor: 1 DC motor: 2
Heads:	Rec/PB head: Special Hard Permalloy Combination Erase head: Ferrite
Semiconductors:	TR: 84 Diodes: 24 IC: 18 LED: 24
Power Supply:	AC120V/60 Hz
Power Consumption:	34 watts
Dimensions:	435(W)×112(H)×372(D)mm (17-1/8"×4-3/8"×14-5/8")
Weight:	6.5kg.(14.3lbs.)

Specifications and external appearance are subject to change without notice because of product improvements.

## SERVICE PROCEDURES

### 1. Insulation resistance measurement

Connect the insulating-resistance tester between the plug of power supply cord and chassis.

Specifications; 500 V more than 10 MΩ

### 2. Replacing the lamps

This unit used the lamps listed below.

Circuit No.	Parts No.	Description
Mechanism	24606173	50mA, 14V. Lamp
145a		
PL601	210090	150mA, 14V. Lamp
PL-902	210172	0.06A 14V. Lamp

CAUTION: Before replacing the lamps, be sure to unplug the power supply cable.

### 3. Replacing the Dolby ICs

Because the TA-2056 is 3-head deck, it is equipped with a 4-channel Dolby processor. Two channels are used exclusively for encoding and the other two exclusively for decoding. If there is a difference between the performance of the encode and decode sides, both Dolby B and C NR will not operate properly. To prevent this, the TA-2056 employs the HA-12058-01. The appearance is the same as the standard HA-12058 with colored markings on the top surface of the IC. When replacing the HA-12058-01, the four ICs (109, Q110, Q215, Q219) in the new one should all have the same color markings. If ICs with the same color markings are not available, the Q109-215 and Q110-Q216 colors should be matched. That is, the two encode ICs and the two decode ICs must always be of the same color although it is possible to use different colors on the encode and decode sides when necessary.

## FEATURES

### Three Heads with Special Hard Permalloy For Superior Metal Tape Performance

Having three heads you means you can monitor the actual recorded signal as you record instead of rewinding the tape to check your recording afterward. The 3-head system also has the advantage of making possible the use of separate record and playback gaps, each optimized for its own task. The special hard permalloy head formulation boasts the high saturation flux density and abrasion resistance needed for true metal

tape compatibility.

### ACCUBIAS for the Best Performance With Any Tape

The ACCUBIAS system fine tunes the recording bias to get optimum performance with any kind of tape (not necessary with metal tapes). By setting precisely the correct bias level, you are assured of obtaining the flattest frequency response and highest signal-to-noise ratio that each is capable of producing.

### Dual Sensor Real Time Tape Counter

The tape counter circuit measures the speed of both tape reels and compares them by microcomputer to provide precise remaining of readings of time. This dual sensor technique eliminates small errors in time calculations caused by slight variations in tape thicknesses between different manufacturers to give the most accurate time indications possible.

### 2-Motor Tape Transport with Separate Head Assembly Motor

The tape transports system, along with the heads, determines the level of performance of a cassette deck. To guarantee extremely stable and accurate transport this unit uses a DC servo controlled capstan motor. This motor is unaffected by fluctuations in the power supply voltage and frequency or instantaneous changes in load. A highly reliable, simple drive transmission system and precision vertical cassette holder further enhance overall accuracy and stability. As a result, wow and flutter is under 0.045%. In addition, separate DC motors drive the reel tables and head base and the head assembly is constructed to move silently with no annoying clicks.

### Dolby B and C Noise Reduction

Along with standard Dolby B NR, this unit also has the even more effective Dolby C NR system. Dolby C NR reduces tape background noise by 20 dB at 5 kHz, about 3 times more than Dolby B NR. In addition to its wide band noise reduction, Dolby C NR uses a sliding band tech technique that varies the band width of noise reduction according to the input level, thereby avoiding noise "pumping." Dolby C NR also has an anti-saturation effect to reduce the chance of tape saturation in the high range. All these features combine to eliminate the adverse effects on tape sound that other noise reduction systems can cause.

### Remote Control Unit Terminal

With an optional remote control unit (such as the RC-5T), this unit can be controlled even while you are relaxing in your favorite chair. All transport modes are included: record, play, fast forward, rewind, stop and pause.

### Sensitive 2-Color 12-Segment LED Level Meter with Peak Hold

This easy-to-read meter has a peak hold function to make it easy to determine the highest output level in a program to be recorded so that the recording input level can be set to the correct point.

## INPUT PORT EXPANDER IC

Q718 LC-7800

The equivalent circuit of the LC7800 used to expand input ports is shown in Figure 1. This IC includes four 4-bit input ports, one 4-bit output port, and one 4-bit selector input port. When BA of the selector input is set to LOW and the other bits to HIGH, the A0" A1" A2" A3 input port is connected to the O0" O1" O2" O3 output port. And if only the SB bit is set to LOW, the B0" B1" B2" B3 input is selected. Hence, a LOW level signal is applied to the selector port bits in cyclic order, and the operation indicator LEDs are switched on and off dynamically in combination with the # 13, # 14, and # 15 LED output ports while input port data is being read out.

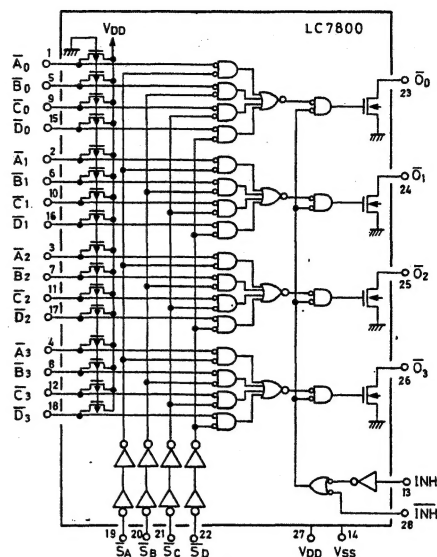


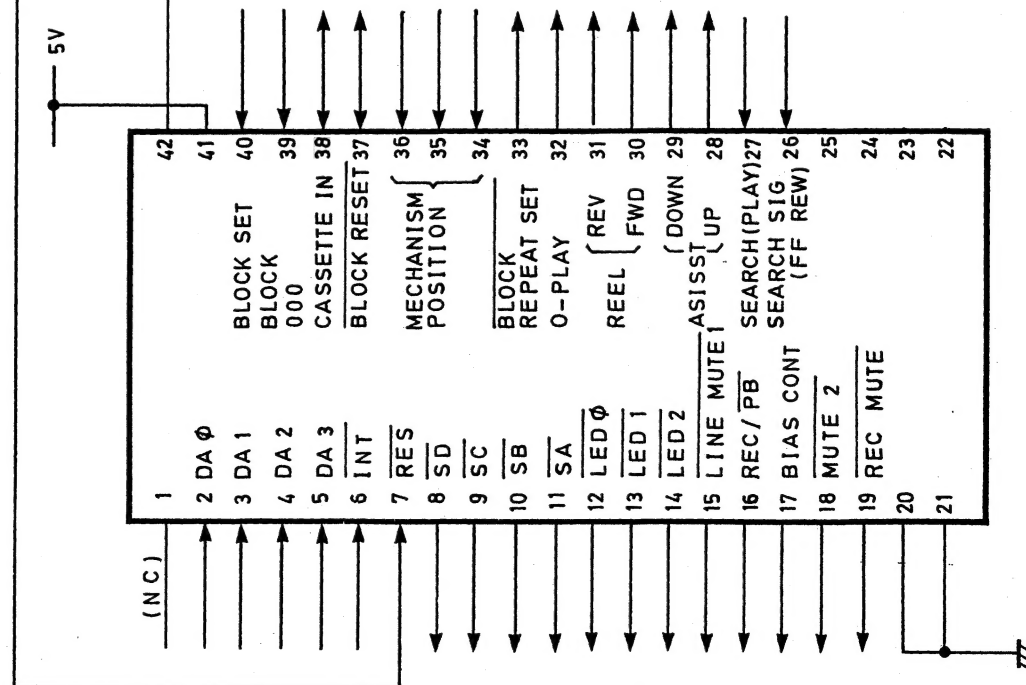
Fig. 1 LC7800 equivalent circuit

## LM6402H-425 PIN ALLOCATION

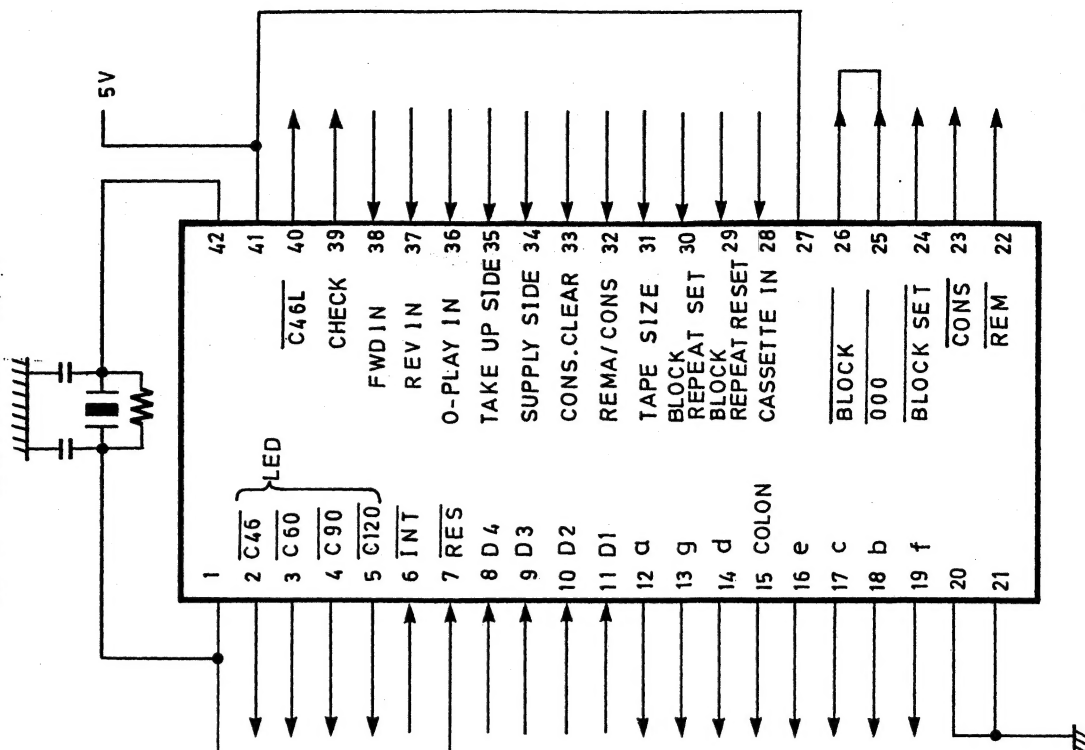
Pin no.	Name	Function	Classification
2~5	DA0~DA3	Reading of data from the input port expander IC	IN
6	$\overline{\text{INT}}$	Rotation signal input (for auto-stop operation)	IN
8~11	$\overline{\text{SA}} \sim \overline{\text{SD}}$	Input port expander IC and dynamic LED selector IC	OUT
12~14	$\overline{\text{LED0}} \sim \overline{\text{LED3}}$	Operation display dynamic LED data output	OUT
15	$\overline{\text{LINE MUTE 1}}$	Line muting output signal generated when the power is switched on, and during ACCU BIAS operation.	OUT
16	REC/PB	Output signal for muting DIN outputs when recording	OUT
17	BIAS CONT.	Output signal for control of bias oscillator	OUT
18	$\overline{\text{MUTE2}}$	Signal for switching muting off during playback	OUT
19	$\overline{\text{REC. MUTE}}$	Signal for muting the recording amplifier output	OUT
22		} NO CONNECTION	
23			
24			
25			
26	SEARCH SIG (HIGH)	Input signal from high-speed travel tune-selector amplifier	IN
27	SEARCH SIG (LOW)	Input signal from low-speed travel tune-selector amplifier	IN
28	UP	Output signal for driving the assist motor towards the PLAY position.	OUT
29	DOWN	Output signal for driving the assist motor towards the FF/REW position.	OUT
30	FWD	Output signal for driving the reel motor towards the FF position.	OUT
31	REW	Output signal for driving the reel motor towards the REV position.	OUT
32	O-PLAY	Reel motor torque switching output	OUT
33	$\overline{\text{BLOCK SET}}$	Output which informs the counter IC that the BLOCK SET key has been pressed.	OUT
34~36	a.b.c	Input ports for signal from the mechanism position switches	IN
37	BLOCK RESET	Output which informs the counter IC that the BLOCK RESET key, or any other key apart from the BLOCK SET key has been pressed.	OUT
38	CASSETTE IN	Input involved in detection of cassette half. and output which stops the capstan motor when an abnormal mechanism status is detected.	I/O
39	$\overline{\text{BLOCK MATCHING}} \& \overline{\text{000 INPUT}}$	Input of 000 input signal and BLOCK matching signal from the counter IC.	IN
40	$\overline{\text{BLOCK SET}}$	Input which accepts signals from the counter IC during BLOCK SET.	IN

## MICRO COMPUTER

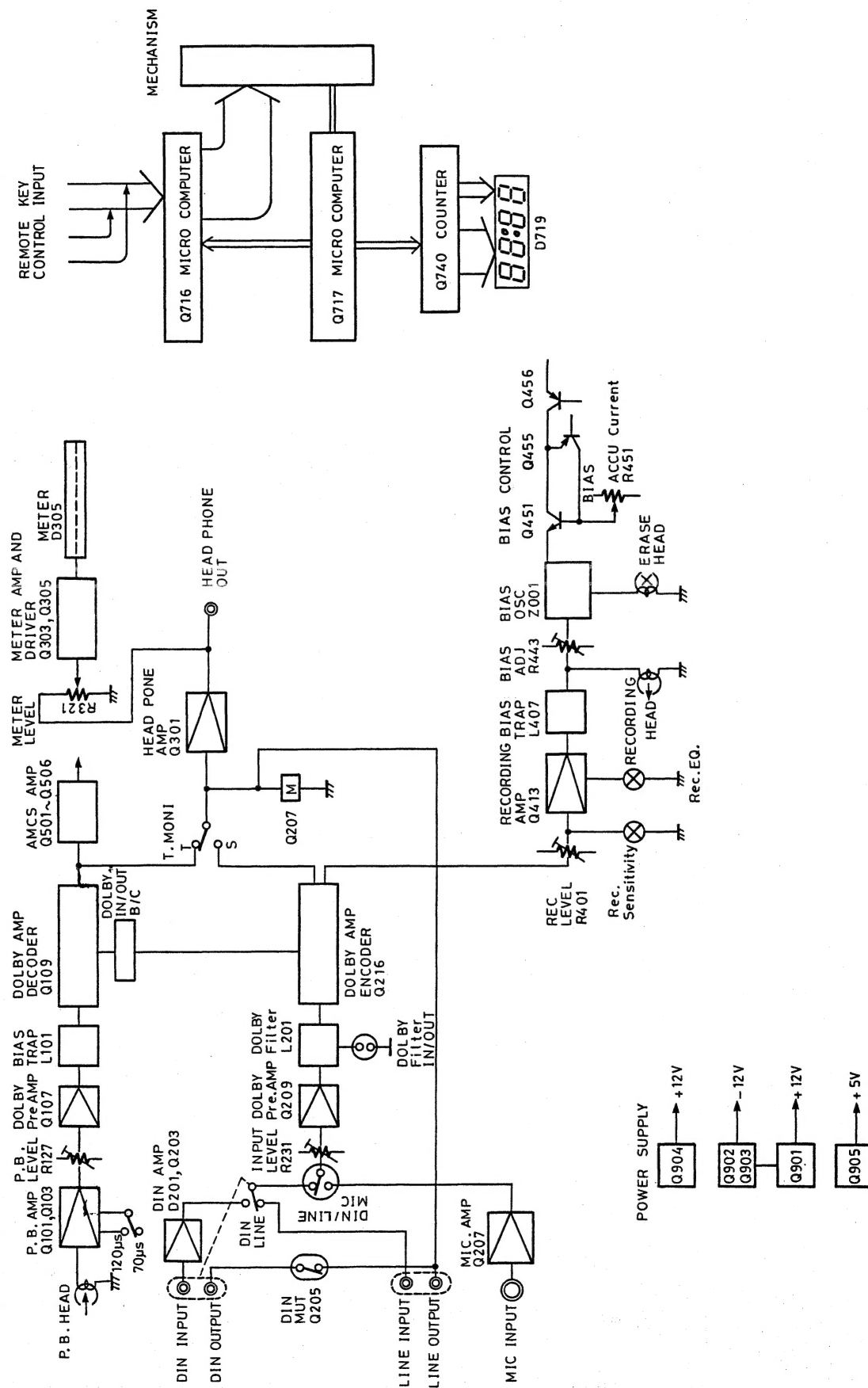
Q716 LM6402H-425



Q717 LM6402H-424



## BLOCK DIAGRAM

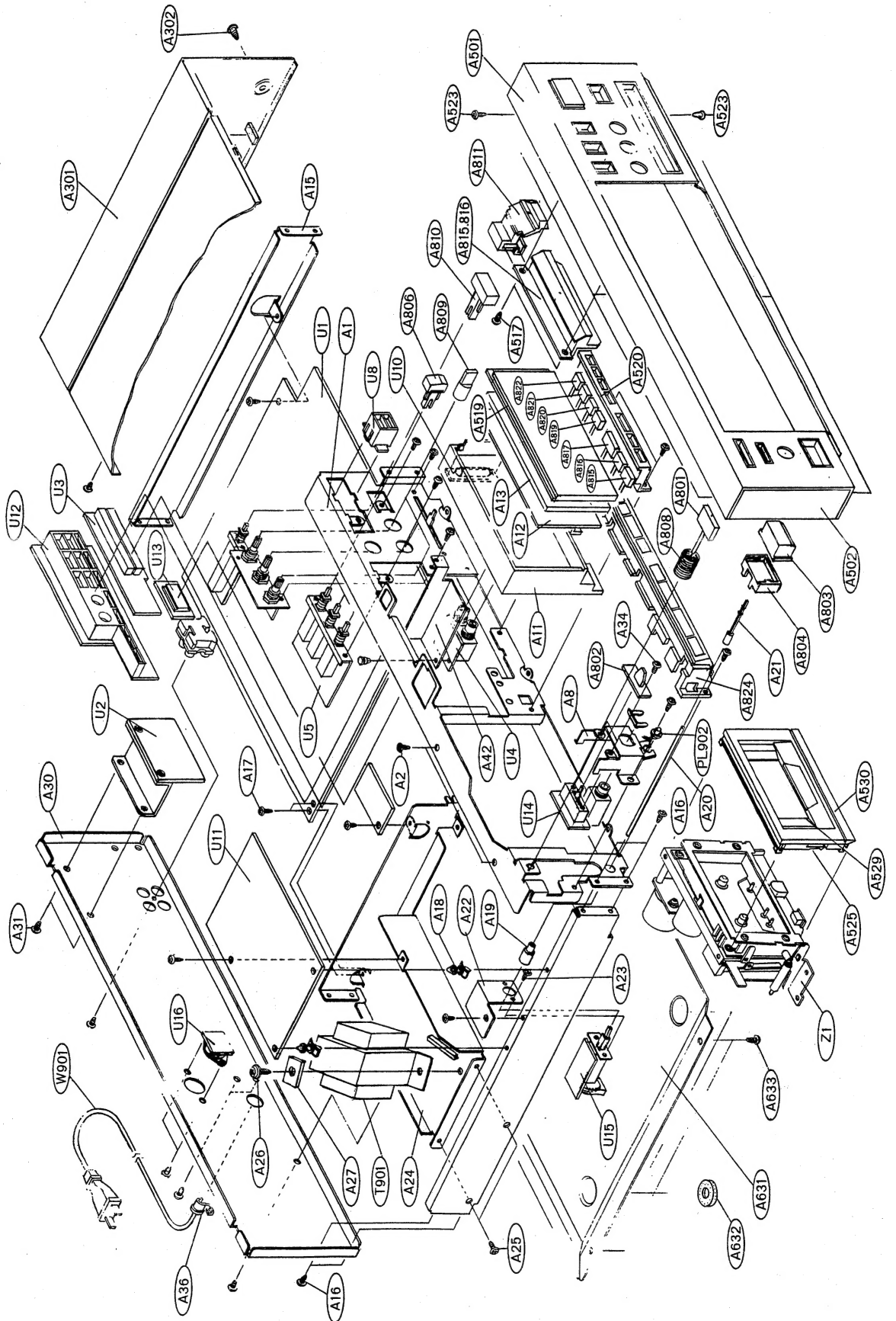


## CHASSIS-EXPLODED VIEW PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A1	27110222A	Front bracket	A524	838430088	3TTB+ 8B(BC),Tapping screw
A2	834426068	2.6TTS+ 6B(BC),Tapping screw	A525	27300697	Cassette lid
A3	28175103	Insulating plate	A526	28191175B	Clear plate
A4	82143006	3P+ 6FN(BC),Pan head screw	A529	27300701	Window
A5	82142604	2.6P+ 4F(BC),Pan head screw	A530	27300699A	Window,decoration(S)
A6	82142003	2P+ 3F(BC),Pan head screw		27300700A	Window,decoration(B)
A7	27140940	Bracket FL	A533	27262296	Plate,decoration(S) J.M.S...
A8	27140909	Bracket HT		27262297A	Plate,decoration(B)
A9	834430068	3TTS+ 6B(BC),Tapping screw	A535	833420068	2TTP+ 6B(BC),Tapping screw
A10	27140943	Bracket FR	A631	27170250	Bottom board
A11	27190285A	Holder	A632	27175011C	Leg
A12	28133104A	Back plate	A633	838430068	3TTB+ 6B(BC),Tapping screw
A13	28191256A	Clear plate B	A801	28321027	Knob ass'y.eject(S)
A15	27115139B	Side bracket		28321028	Knob ass'y.eject(B)
A16	834430068	3TTS+ 6B(BC),Tapping screw	A802	28321035	Knob,timer(S)
A17	831430088	3TTW(BC),Tapping screw		28321036	Knob,timer(B)
A18	27190009	Holder	A803	28321023	Knob,power(S)
A19	28320135	Connector		28321024	Knob,power(B)
A20	27260156	Shaft	A804	28320828C	Base,knob
A21	27273016	Joint	A806	28321148	Knob,select(S)
A22	27140910	Bracket,power		<del>28321722</del>	Knob,select(B) 28321742
A23	82143006	3P+ 6FN(BC),Pan head screw	A808	27180179	Spring
A24	27130331E	Bracket PT	A809	28321154	Knob M (S)
A25	834430068	3TTS+ 6B(BC),Tapping screw		28321721	Knob M (B)
A26	830440109	4TTT+ 10C(BC),Tapping screw	A810	28321605A	Knob M(S)
A27	870065	Special washer		28321606A	Knob M(B)
A28	831430088	3TTW+ 8B(BC),Tapping screw	A811	28321623A	Knob ass'y,volume(S)
A29	86414010	FWN4×10FN,Flange nut		28321624A	Knob ass'y,volume(B)
A30	27120606A	Back panel	A815	28321609A	Knob,tape(S)
A31	834430068	3TTS+ 6 B(BC),Tapping screw		28321616A	Knob,tape(B)
A32	834430108	3TTS+ 10B(BC),Tapping screw	A816	28321610A	Knob,model(S)
A33	801230	3TTS+ 8BQ(BC),Tapping screw		28321617A	Knob,model(B)
A34	82142604	2.6P+ 4F(BC),Pan head screw	A817	28321611A	Knob,preset(S)
A36	270025	SR-3P-4,Strainrelief		28321618A	Knob,preset(B)
A38	28140553	10×30×13t,Cushion	A819	28321612A	Knob,single(S)
A39	28170014	Bushing		28321619A	Knob,single(B)
A40	28140373	7×30×10,Cushion	A820	28321613A	Knob,full(S)
A41	223004-1	Terminal		28321620A	Knob,full(B)
A42	27150185	Shielded plate	A821	28321614A	Knob,block(S)
A43	880009	Rivert		28321621A	Knob,block(B)
A44	27150187	Shielded plate SW	A822	28321615A	Knob,preset(S)
A45	87643008	W3×8F(BC),Flat washer		28321622A	Knob,preset(B)
A50	27140577	Bracket DIN(G/W)	A823	28140560	0.9×5×120,Cushion
A51	82143006	3P+ 6F(BC),Pan head screw	A824	28321585A	Knob ass'y,base(S)
		for terminal DIN(G/W)		28321586A	Knob ass'y,base(B)
A301	28184235	Top cover(S)	P1	260208	Binder
	28184236	Top cover(B)	△ PL902	210172	PL14VO.06AW-2.0,Lamp
A302	838440089	4TTB+ 8C(BC),Tapping screw	T901	230819	NPT-845D,Power transformerRec
A303	83843088	3TTB+ 8B(BC),Tapping screw		230820	NPT-845G,Power transformer
A304	28140408	3×10×36,Cushion	U1	11348556	NAAF-2056,Rec/pb amplifier pc board ass'y
A501	11352121	Front panel ass'y(S)	U2	11348557	NAPS-2057,Power supply pc board ass'y
	11372121	Front panel ass'y(B)	U3	11348558	NADIS-2058,Meter LED pc board ass'y
A502	28125133	End cap L(S)	U4	11348559	NAMC-2059,Mic.amplifier pc board ass'y
	28125135A	End cap L(B)	U5	11348560	NASW-2060,Tape monitor switch pc board ass'y
A503	28125134	End cap R(S)	U6	11348561	NAVR-2061,Main volume pc board ass'y
	28125136A	End cap R(B)	U7	11348562	NASW-2062,Dolby switch pc board ass'y
A505	27267238A	Guide,eject(S)	U8	11348563	NADIS-2063,Monitor indicator pc board ass'y
	27267239A	Guide,eject(B)	U9	11348564	NAHP-2064,Headphone terminal pc board ass'y
A506	27267339	Guide,timer(S)	U10	11348565	NAPL-2065,Edge light pc board ass'y
	27267340	Guide,timer(B)	U11	11348566	NACOC-2066,Control circuit pc board ass'y
A507	27267206B	Guide,power(S)	U12	11348567	NADIS-2067,LED pc board ass'y
	27267235B	Guide,power(B)	U13	11348568	NADIS-2068,Counter indicator pc board ass'y
A508	28198577	Facet, power	△ U14	11348569	NASW-2069,Timer switch pc board ass'y
A509	27267264A	Guide,selector(S)	U15	11348570	NASW-2070,Power switch pc board ass'y
	27267255	Guide,selector(B)	U16	11348571	NARM-2071,Remote control terminal pc board ass'y
A510	27267341	Guide M(S)	U17	11348572	NASW-2055,Operation switch pc board ass'y
	27267342	Guide M(B)	△ W901	253099B	AS-UC-3,Power supply cord
A511	28191257A	Clear plate M(S)	Z1	244065	NDM-57,Tape mechanism ass'y
	28191259A	Clear plate M(B)			
A512	27267343	Guide,volume(S)			
	27267344	Guide,volume(B)			
A515	27300696	Rail,volume			
A516	27262292	Plate,volume(S)			
	27262293	Plate,volume(B)			
A517	833430080	3TTP+ 8P(BC),Tapping screw			
A519	28191260	Clear plate			
A520	27267345	Guide,knob(S)			
	27267346	Guide,knob(B)			
A521	834430108	3TTS+ 10B(BC),Tapping screw			
A523	838430068	3TTB+ 6B(BC),Tapping screw			

Note: The components identified by mark  $\Delta$  are critical for risk of fire and electric shock. Replace only with parts number specified.

# CHASSIS-EXPLODED VIEW



# TAPE MECHANISM-PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24611042	Chassis	94e	24610969	1.3×3.4×0.5mm,Washer
11	24611043	Brake plate ass'y	94f	24610970	Felt
11a	24611053	Brake plate	94g	24602237	Wheel,motor
11b	24610999	Brake rubber	94h	24610981	1.7×4×0.25mm,Washer
11c	24605500	Spring	94i	24610374	Washer
13	24606294	Sensor pc board ass'y	94j	24611048	Holder,spring
21	24611044	Head base ass'y	95	352942206	22μF,16V,Elect.capacitor
21a	24611045	Head base	105	24602268	Flywheel
21b	24611046	Head block	107	24605452	Spring,thrust
21c	24605502	Spring	110	24602269	Flat belt
21d	82512012	2×12mm,Binding screw	112	24610673	Flat washer
21e	801250	2×4mm,Pan head screw	115	24610965	Holder,flywheel
21f	24600037A	Rec/pb.head	115a	24610971	Plate,flywheel
21g	24600041	Erase head	115b	24610671	Holder,thrust
21h	24605462	Spring	115c	24601113	Motor ass'y,capstan
21i	24611052	Binder	115d	24601085	Motor,capstan
21j	24611054	Stopper	115e	24601107	Pulley,motor
21k	24611055	Washer	115f	24610451	Cushion
21l	82112002	2×2mm,Pan head screw	115g	801261	Pan head screw with washer
21m	801251	Screw	115h	24610807	Spacer
21n	24610652	Shaft	121	24602270	Arm,pinch roller
21o	24610495	Adjustment nut	123	24605370	Spring
21p		Connector ass'y	125	833125069	2.5×8mm,Pan head screw
21q		Connector ass'y	126	833125059	2.5×5mm,Pan head screw
21r		Connector ass'y	129	801250	2×4mm,Pan head screw
21s	24604061	Spacer	131	82512614	2.6×14mm,Binding screw
21t	24604062	Spacer	133	833426105	2.6×10mm,Tapping screw
22	893030	E3,Circlip	134	833126055	2.6×5mm,Tapping screw
46	24610943	φ3mm,Steelball	136	837120058	2×5,Truss screw
47	24610963	Plate,head holding	137	801292	2×3mm,Truss screw
53	24610964	Spring holder	139	24610349	1.8×3.2×0.5mm,Washer
54	24605501	Spring	140	24610515	2.6×4.7×0.25mm,Washer
55	24605505	Spring	141	24610972	2.6×4.7×0.13mm,Washer
56	24602267	Reel stand ass'y	142	24610973	2.7×6×0.5mm,Washer
63	24606203	Sensor switch ass'y	150	14605481	Spring
63a	24611056	Plate switch holding	151	24611018	Panel ass'y
63b	24606205	Leafswitch	152	24602271	Belt
63c	24611057	Washer	155	24611079	Break
63d	82112030	2×30mm,Pan head screw	156	833130049	Pan head screw
63e		Connector ass'y	158	24610939	Plate,right side
63f	24611058	Washer	164	24605188	Spring,cassette
70	24603281	Lever,switch	168	24610940	Holder ass'y
71	24603282	Lever,switch,metal	168a	24610949	Plate,holder
72	24611049	Plate,lock	168b	24610849	Holder,right
73	24605503	Spring	168c	24610848	Holder,left
74	891030	CS3,Circlip	168d	24605463	Spring,cassette
76	24601167	Pulley ass'y	168e	835426082	2.6×8mm,Flat head screw
77	24611047	2.1×4.5×0.1,Washer	172	24611050	Plate ass'y,left side
78	24611003	1.8×3.8×0.5,Washer	172a	24611059	Plate,left
80	24601144	PAD unit ass'y	172b	24603283	Lever,cancel
80a	24610968	Plate	172c	24605504	Spring
80b	24601103	Motor PAD	172d	893030	E3,Circlip
80c	24606182	Leafswitch	172e	24610452	Flat washer
80d	24602133	Cam gear	179	24611051	Damper unit
80e	82112003	2×3mm,Pan head screw	180	24605456	Spring
80f	833125209	2.5×20mm,Pan head screw	181	891025	CS2.4,Circlip
80g	24606181	Pc board	184	24606168	Holder ass'y,lamp
80h	25055106	Post with base	184a	24610498	Holder,lamp
80i	352942206	22μF,16V,Elect.capacitor	184b	24606173	14V,50mA,Lamp
90	24611052	Binder			
94	24601168	Reel motor ass'y			
94a	24601169	Reel motor			
94b	24605467	Spring			
94c	24602235	Lever ass'y,wheel			
94d	24602236	Wheel			

## ADJUSTMENT PROCEDURES

### PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistened swab.
  - \* record/playback head      \* erase head
  - \* pinch roller                \* capstan
- Do not use magnetized screwdriver for adjustments.
- Demagnetize record/playback head with a head demagnetizer.

### TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator  
 Digital frequency counter  
 Oscilloscope  
 Attenuator  
 AC voltmeter DC voltmeter      voltmeter

Blank tapes (completely erased)

NORMAL.....NEW UD 90  
 HIGH.....NEW XL-II 90  
 METAL.....NEW MX 60

Test tapes

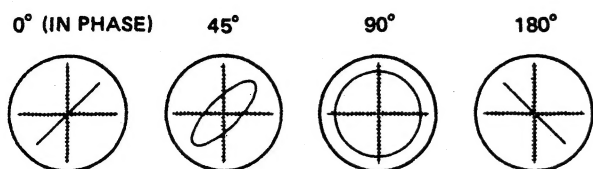
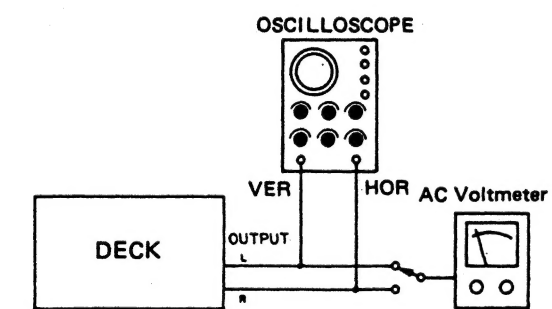
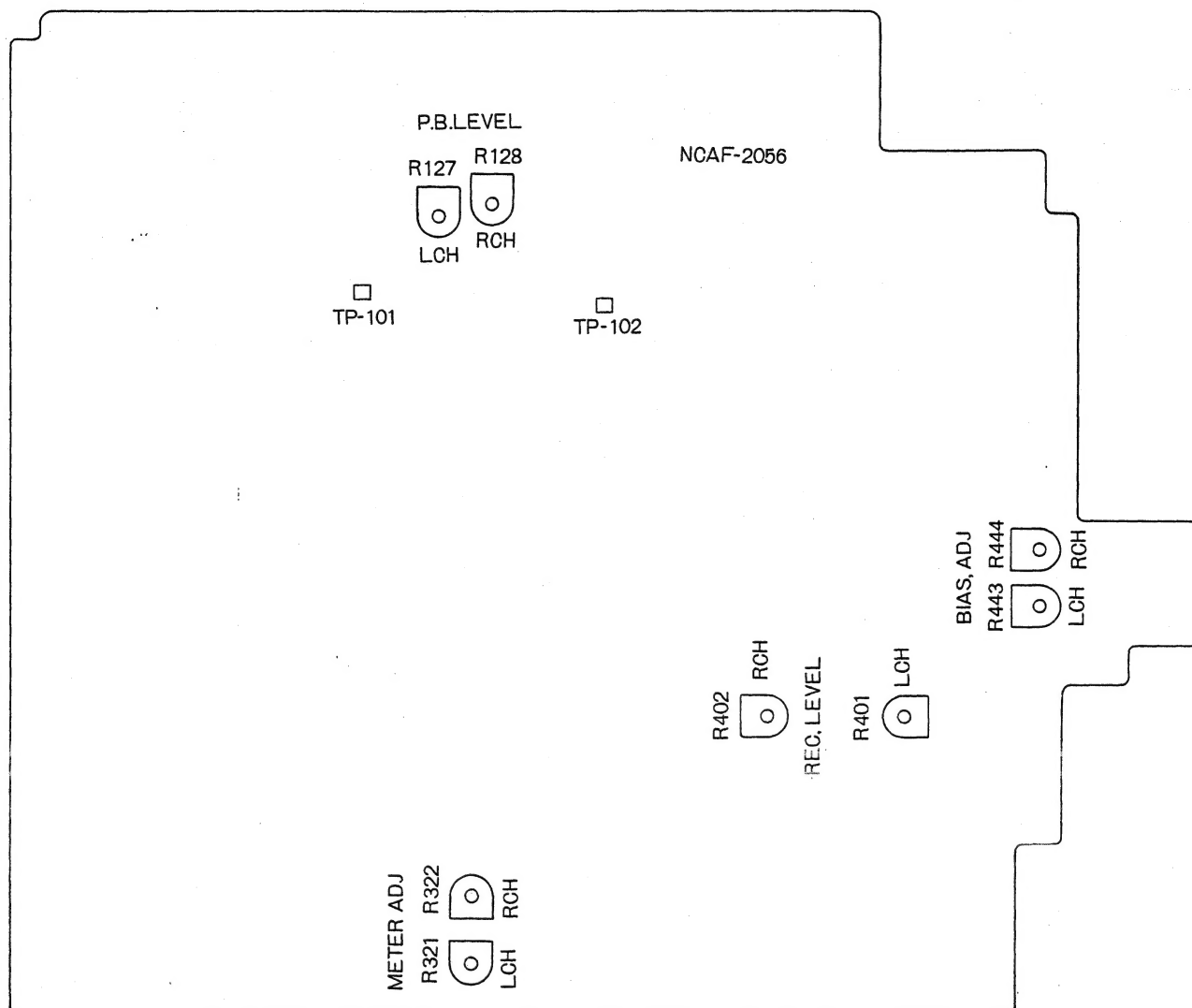
VTT-658 : 10 kHz, -15 dB  
 MTT-111 : 3 kHz, -10 dB  
 MTT-150 : Dolby level calibration  
 400 Hz tone 200 nWb/m

Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1 Playback torque			TW-2111	PB	TW-2111	R-711	35 to 55gcm	
2 Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the moter	3,000 to 3,010 Hz	
3 Heed azimuth	AC voltmeter and oscilloscope LINE output terminal		VTT-658	PB	AC voltmeter	Head azimuth screws	Maximum and same phase at channels L and R.	See fig.1 Set the semi-fixed resistors R127 and R128 to center position.
4 Playback level	AC voltmeter terminals TP-101 and TP-102		MTT-150	PB	AC voltmeter	R-127(R) R-128(R)	580mV	
5 Meter			MTT-150	PB	Level meter	R-321(L) R-322(R)	OdB indicator lights on	
6 Bias current	Fig. 2	1kHz, -20dB and 12kHz, -20dB	NEW XL-II 90	REC/ PB	AC voltmeter	R-443(L) R-444(R)	Same level at REC/PB	INPUT VOLUME.....maximum AUU BIAS VOLUME..... .....center
7 Record level	Fig. 2	1kHz		REC PAUSE	AC voltmeter	Attenuator or AF OSC output		INPUT VOLUME..... .....maximum
				REC/ PB	AC voltmeter	R-401(R) R-402(R)	Same level at REC/PB.	ACCU BIAS VOLUME .....Center

PLAY TORQUE.....30~60g/cm

FF REW TORQUE.....70~140g/cm

BACK TENSION.....3.5~6.5g/cm



Confirming phase relationship

fig-1

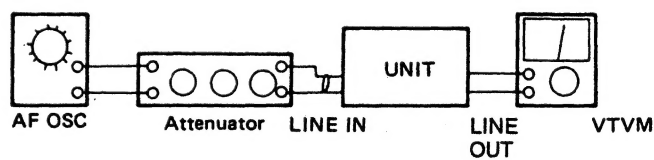


fig-2

# PRINTED CIRCUIT BOARD PARTS LIST

## Control circuit pc board (NACOC-2066)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q716	222777	LM6402H-425
Q717	222776	LM6402H-424
Q718	222810	LC7800
Q731—Q736	222840692	TC4069UBP
Q740	222639	LBI275
	Transistors	
Q701	2201074,	2SD880 (Y),
	2201385 or	2SD330 (E),
	2201035	2SD325 (E),
Q702, Q703	2211563	2SB562 (C)
Q704, Q705	2211254,	2SC1815 (Y),
	2212114,	2SC2458 (Y),
	2210747 or	2SC945A (Q1) or
	2212484	JC501 (P)
Q706, Q707	2211682 or	2SD468 (B) or
	2211683	2SD468 (C)
Q708, Q712	2201060,	2SD549,
Q713	2201292 or	2SD985 (L) or
	2201291	2SD985 (K)
Q709	2211255,	2SC1815 (GR),
	2212115,	2SC2458 GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q710, Q711	2211554	2SA562TM (Y)
Q714	2211951 or	2SC1472K (A) or
	2211952	2SC1472K (B)
Q715, Q724	2211254,	2SC1815 (Y),
Q725—Q730	2212114,	2SC2458 (Y),
Q738	2210747 or	2SC945A (Q1) or
	2212484	JC501 (P)
Q719, Q720	2211454,	2SA1015 (Y),
Q746—Q750	2212124 or	2SA1048 (Y) or
	2212494	JA101 (P)
Q721—Q723	2211255,	2SC1815 (GR),
Q739	2212114,	2SC2458 (GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q741	2211544	2SC1959 (Y)
Q742—Q745	2211706	2SD655 (F)
	Diodes	
D701	2239552,	RD8.2EB2,
	2242866 or	EQA02-08C or
	2243192	MTZ8.2B
D702—D705	223105,	1S1555,
	223133,	DS442X,
	223145 or	1S2076TD or
	223150	US1040
	X' tal	
	3010069	CSB800A
	Capacitors	
C703—C705	352780109	1 $\mu$ F, 50V, Elect.
C706, C707	352782299	0.22 $\mu$ F, 50V, Elect.
C710	352780109	1 $\mu$ F, 50V, Elect.
C713	352781599	0.15 $\mu$ F, 50V, Elect.
	Resistors	
R711	5215045 or	NO8HR10KBC,
	5215021	Semi-fixed
R714	441722704	27 $\Omega$ , 2W, Metal oxide film
R721—R731	49163392411	3.9k $\Omega$ $\times$ 11.1/10W, Network
R738—R748		
R734—R737	49163392404	3.9k $\Omega$ $\times$ 4, 1/10W, Network
R751—R755	49163392405	3.9k $\Omega$ $\times$ 5, 1/10W, Network
R771—R774	49121392404	3.9k $\Omega$ $\times$ 4, 1/10W, Network

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R788—R800	49163392413	3.9k $\Omega$ $\times$ 13, 1/10W, Network
	Sockets	
P702A	2000265A	NSAS-18P-203
P705A	2000315	NSAS-6P-274
	Plugs	
P703	25055046	NPLG-10P-34
P704	25055137	NPLG-7P-121
P706	25055152	NPLG-8P-136
P707	25055149	NPLG-5P-133
P708	25055148	NPLG-4P-132
P709	25055147	NPLG-3P-131
P710	25055154	NPLG-10P-138
P711	25055148	NPLG-4P-132
P712	25055109	NPLG-12P-93

## Led pc board (NADIS-2067)

CIRCUIT NO.	PART NO.	DESCRIPTION
	LEDs	
D409—D411	225137	SEL-2413E
D604, D606	225137	
D714—D716	225142	SEL-2913K
D717, D718	225142	SEL-2913K
D720—D724	225137	SEL-2413K
	Switches	
S711—S717	25035389	NPS-111-S353
	Sockets	
P706A	2000328	NSAS-16P-287
P707A	2000327	NSAS-10P-286
P708A	2000326	NSAS-8P-285
P709A	2000325	NSAS-6P-284
P713A	2000321	NSAS-14P-280
	Holder	
	27190287A	LED

## Counter indicator pc board (NADIS-2068)

CIRCUIT NO.	PART NO.	DESCRIPTION
D719	225094	LED
	2000322	NS AS-12P-281, Socket

## Timer switch pc board (NASW-2069)

CIRCUIT NO.	PART NO.	DESCRIPTION
	25065224	NSS-2398, Slide switch

## Power switch pc board (NASW-2070)

CIRCUIT NO.	PART NO.	DESCRIPTION
C931	3500065A	DE7150FZ103PA, Capacitor 1S
S901	25035375	NPS-111P L339P, Power switch
C931a	27300601	SB-1925, Cover, capacitor

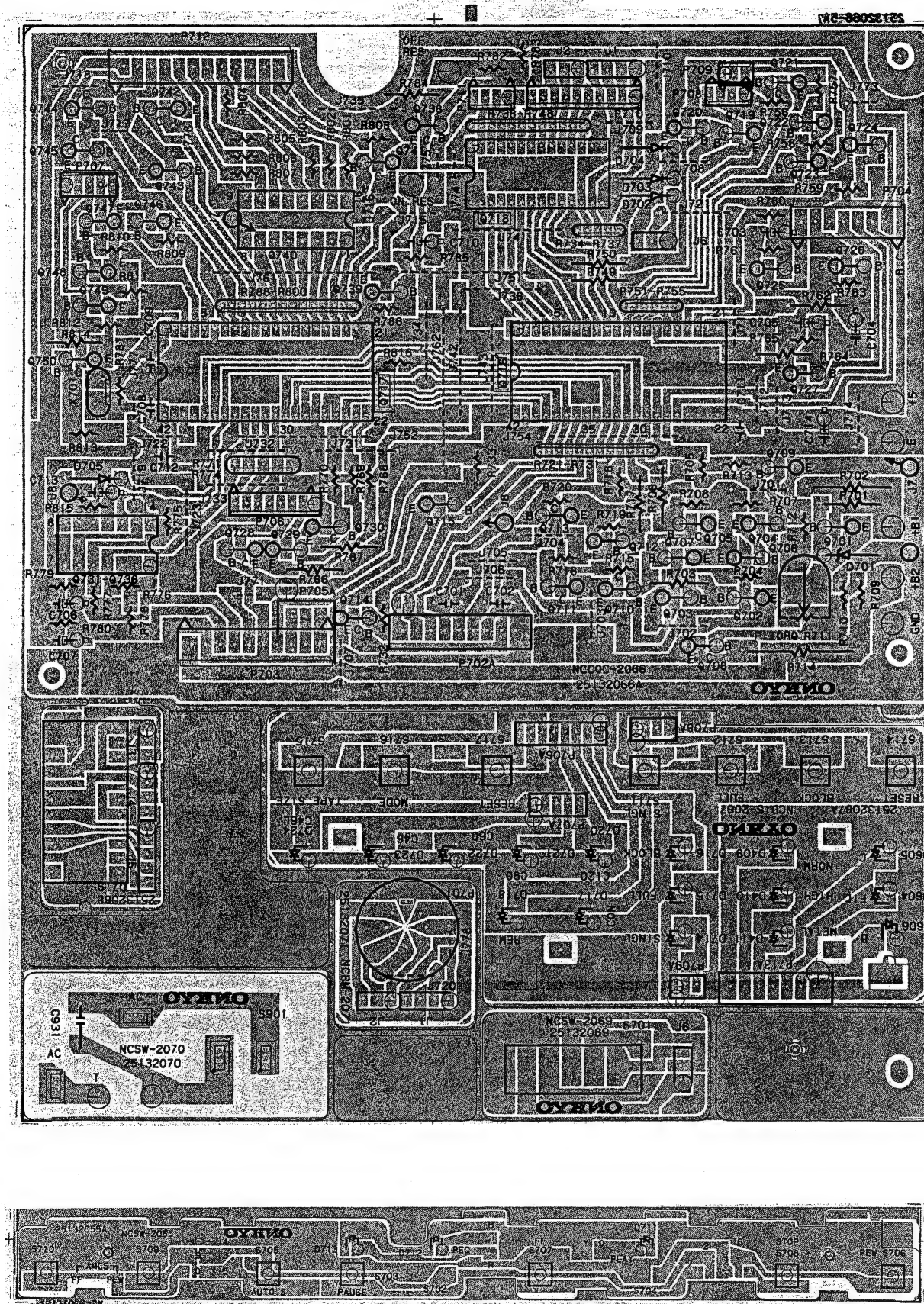
## Remote control pc board (NARM-2071)

CIRCUIT NO.	PART NO.	DESCRIPTION
P701	25050070	NSCT-7P20

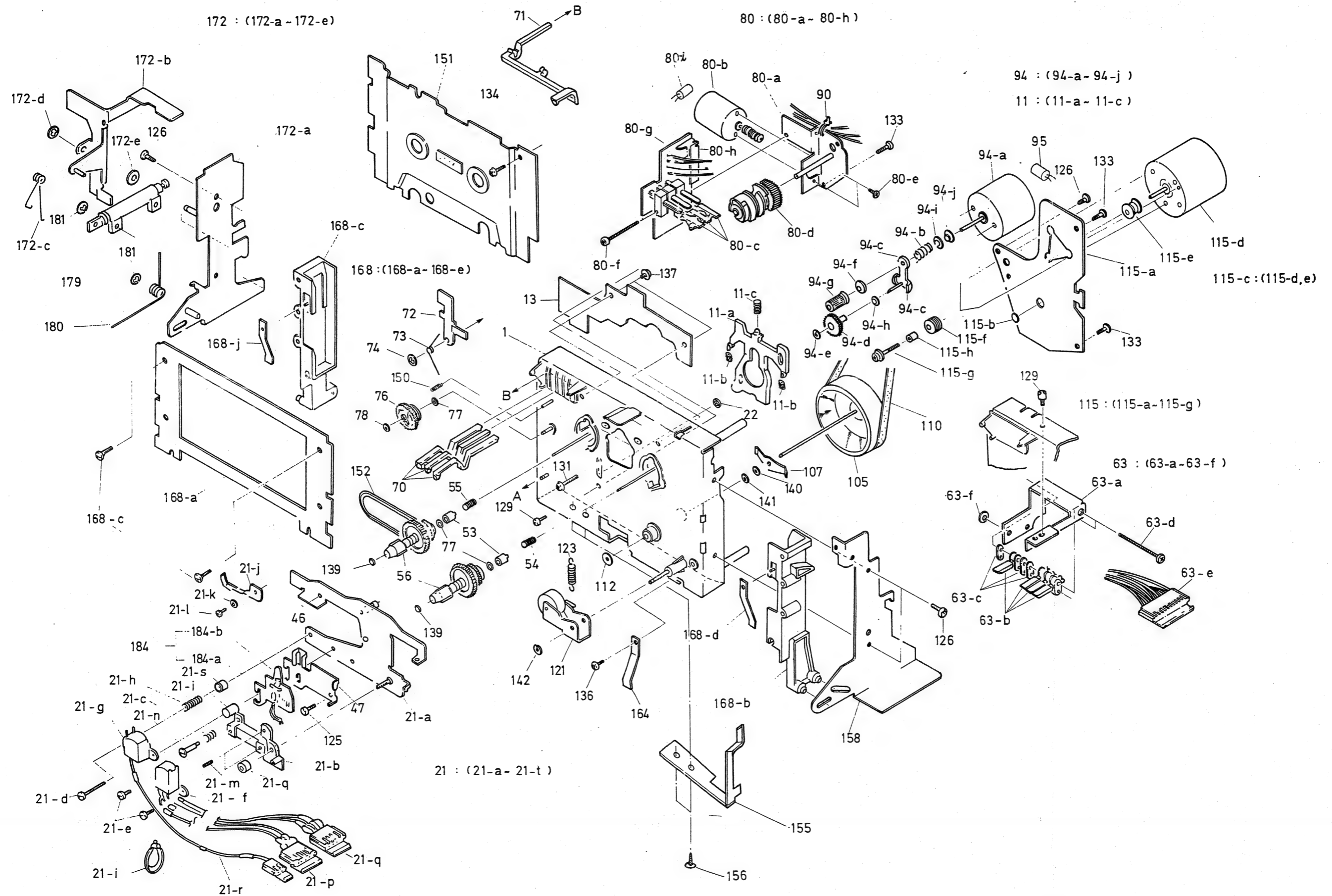
## Operation switch pc board (NASW-2055)

CIRCUIT NO.	PART NO.	DESCRIPTION
D711	225134	3NG1, LED
D712, D713	225126	3PR1, LED
S702, S704	25035408	NPS-111-S372, Push switch
S703	25035389	NPS-111-S353, Push switch
S705—S710	25035389	NPS-111-S353, Push switch
	2000324	NSAS-4P-283, Socket
	2000323	NSAS-10P-282, Socket

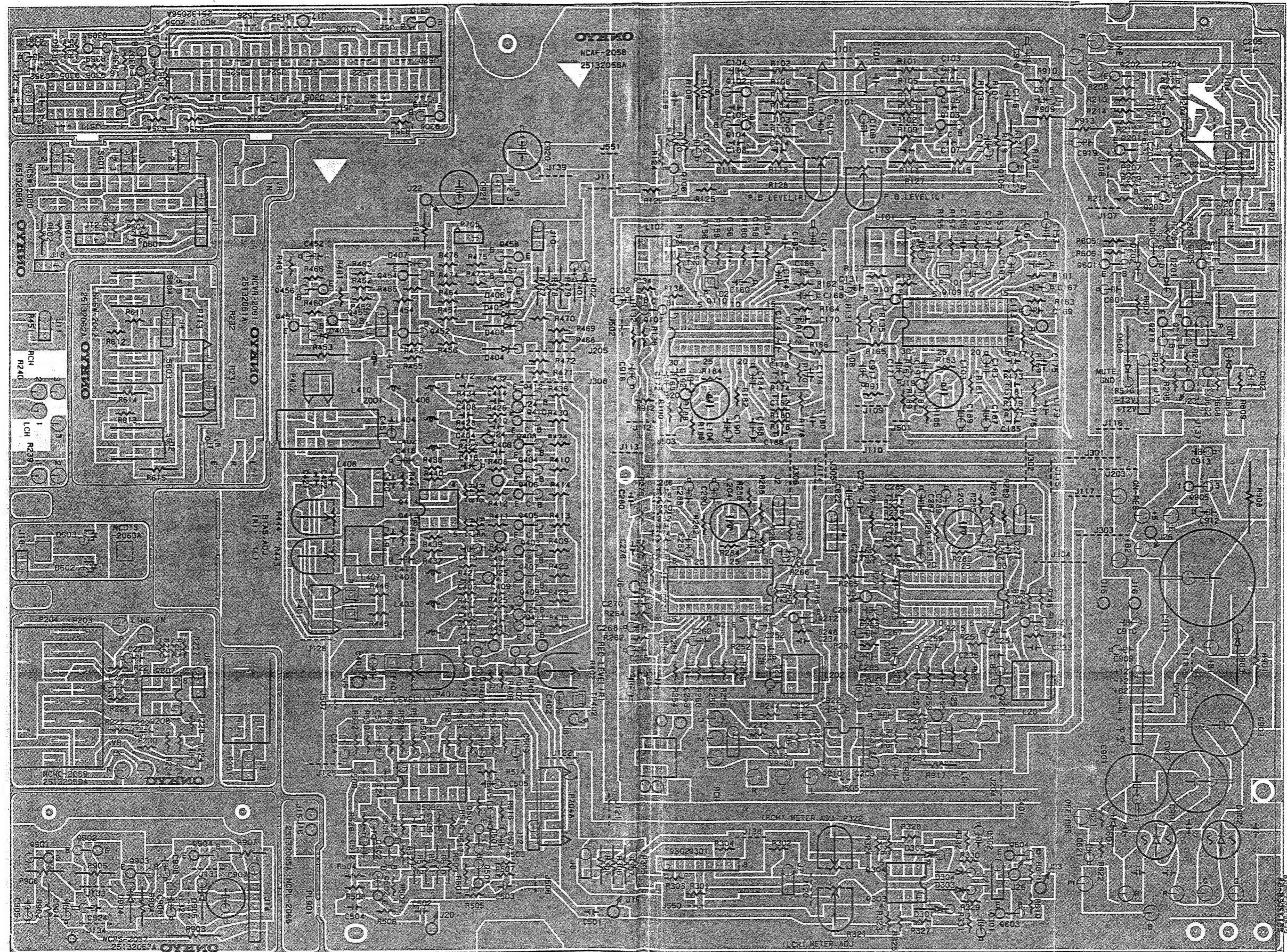
## PC BOARD VIEW FROM BOTTOM SIDE



## TAPE MECHANISM-EXPLODED VIEW



## PC BOARD VIEW FROM BOTTOM SIDE



# PRINTED CIRCUIT BOARD PARTS LIST

Rec./pb. amplifier pc board (NAAF-2056a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs		D902	223868	2w02
Q109, Q110	222815,	H A12058NT-01Y	D903	223842	GP-15B
Q215, Q216	2222814 or	HA12058NT-01G or		Coils	
	222813	HA12058NT-01V	L101, L102	233327	NCH-6100
Q209, Q210	222534,	NJM4559DX,	L103, L104	23345	NMC-2029
	222502 or	NJM4558DX or	L201, L202	233328	NMC-6051
	222811	NJM4558DD	L203, L204	233245	NMC-2029
Q301, Q302	222652	M5218L	L401, L402	233194	NCH-1039
Q303, Q304	222465 or	NJM4558D or	L403, L404	24606070	NCH-1008
Q413, Q414	222808	M5218P	L405, L406	24606069	NCH-1007
Q503-Q506	222695 or	LA6324 or	L407, L408	233329	NCH-6101
	222681	IR3702	L409, L401	231025	NCH-1064
Q905	222780050	7805		Osc. block	
	Transistors		Z001	24606198	NOB-029
Q101-Q104	2211896,	2SC1815 (LL)		Capacitors	
	2212256 or	2SC2458 (LL) or	C103, C104	392880337	3.3 $\mu$ F, 50V, LL
	2211406	2SC2240 (BL)	C109-C112	352741009	10 $\mu$ F, 16V, Elect.
Q105-Q108	2211255,	2SC1815 (GR),	C131, C132	352741009	10 $\mu$ F, 16V, Elect.
Q401, Q402	2212115,	2SC2458 (GR),	C151, C152	352741009	10 $\mu$ F, 16V, Elect.
Q603, Q604	2210766 or	2SC945A (P) or	C153, C154	352732219	220 $\mu$ F, 10V, Elect.
	2212485	JC501 (Q)	C159, C160	392850477	4.7 $\mu$ F, 25V, LL
Q201, Q202	2211896,	2SC1815 (LL),	C163, C164	352783399	0.33 $\mu$ F, 50V, Elect.
	2212256 or	2SC2458 (LL) or	C165, C166	352781599	0.15 $\mu$ F, 50V, Elect.
	2211406	2SC2240 (BL)	C167, C168	352784799	0.47 $\mu$ F, 50V, Elect.
Q203, Q204	2211255	2SC1815 (GR),	C169, C170	352786899	0.68 $\mu$ F, 50V, Elect.
	2212115,	2SC2458 (GR),	C171, C172	352742209	22 $\mu$ F, 16V, Elect.
	2210746 or	2SC945A (P) or	C183, C184	392850477	4.7 $\mu$ F, 50V, LL
	2212485	JC501 (Q)	C187, C188	352781599	0.15 $\mu$ F, 50V, Elect.
Q205, Q206	2212304,	2SK381 (D),	C189, C190	352784799	0.47 $\mu$ F, 50V, Elect.
	2212303	2SK381 (C),	C191, C192	352750479	4.7 $\mu$ F, 25V, Elect.
	2211945 or	2SK246 (GR) or	C201-C204	352780109	1 $\mu$ F, 50V, Elect.
	2211944	2SK246 (Y)	C231, C232	352741009	10 $\mu$ F, 16V, Elect.
Q211-Q214	2211254,	2SC1815 (Y),	C253, C254	352732219	220 $\mu$ F, 10V, Elect.
Q403-Q412	2212114,	2SC2458 (Y),	C259, C260	392850477	4.7 $\mu$ F, 25V, LL
Q452, Q454	2210747 or	2SC945A (Q1) or	C263, C264	352783399	0.33 $\mu$ F, 50V, Elect.
Q501, Q502	2212484	JC501 (P)	C265, C266	352781599	0.15 $\mu$ F, 50V, Elect.
Q217, Q218	2211706 or	2SD655 (F) or	C267, C268	352784799	0.47 $\mu$ F, 50V, Elect.
	2211705	2SD655 (E)	C269, C270	352786899	0.68 $\mu$ F, 50V, Elect.
Q451	2201060,	2SD549,	C271, C272	352742209	22 $\mu$ F, 16V, Elect.
	2201292 or	2SD985 (L) or	C283, C284	392850477	4.7 $\mu$ F, 25V, LL
	2201291	2SD985 (K)	C287, C288	352781599	0.15 $\mu$ F, 50V, Elect.
Q455-Q458	2211454,	2SA1015 (Y),	C289, C290	352784799	0.47 $\mu$ F, 50V, Elect.
Q507, Q508	2212114 or	2SA1048 (Y) or	C291, C292	352750479	4.7 $\mu$ F, 25V, Elect.
Q602	2212494	JA101 (P)	C301, C302	352750479	4.7 $\mu$ F, 25V, Elect.
Q601	2211254,	2SC1815 (Y),	C401, C402	352741009	10 $\mu$ F, 16V, Elect.
	2212114,	2SC2458 (Y),	C415, C416	352782299	0.22 $\mu$ F, 50V, Elect.
	2210747 or	2SC945A (Q1) or	C417, C418	352750479	4.7 $\mu$ F, 25V, Elect.
	2212484	JC501 (P)	C451	352780109	1 $\mu$ F, 50V, Elect.
	Diodes		C452	352722219	220 $\mu$ F, 16V, Elect.
D201, D202	223105,	1S1555,	C505	352741009	10 $\mu$ F, 16V, Elect.
	223133,	DS442X,	C506	352782299	0.22 $\mu$ F, 50V, Elect.
	223145 or	1S2076TD or	C507	352780109	1 $\mu$ F, 50V, Elect.
	223150	US1040	C508	352780339	3.3 $\mu$ F, 50V, Elect.
D301-D304	223105,	1S1555,	C508	352750479	4.7 $\mu$ F, 25V, Elect.
D401, D403	223133,	DS442X,	C512, C513	352780109	1 $\mu$ F, 50V, Elect.
D407, D408	223145 or	1S2076TD or	C514	352750339	3.3 $\mu$ F, 25V, Elect.
D501, D502	223150	US1040	C601, C602	352780109	1 $\mu$ F, 50V, Elect.
D607, D609			C621, C622	352740479	4.7 $\mu$ F, 25V, Elect.
D404, D406	2239673,	RD15EB3,	C901, C902	352751029	1,000 $\mu$ F, 25V, Elect.
	2239691,	RD16EB1,	C903	352752229	2,200 $\mu$ F, 25V, Elect.
	2242922 or	EQA02-14B or	C909, C910	352744709	47 $\mu$ F, 16V, Elect.
	2243253	MTZ15C	C911	3504168	13,000 $\mu$ F, 25V, Elect.
D608	223132	1K60	C912	352783399	0.33 $\mu$ F, 50V, Elect.
D901	223862	WL01	C913	352781099	0.1 $\mu$ F, 50V, Elect.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C915, C916	352731019	100 $\mu$ F, 10V, Elect.
C917, C918	352744709	47 $\mu$ F, 16V, Elect.
C919	352742219	220 $\mu$ F, 16V, Elect.
C923	352742219	220 $\mu$ F, 16V, Elect.
	Resistors	
R127, R128	5215046 or	N08HR50KBC,
R443, R444	5215023	Semi-fixed
R321, R322	5215022 or	N08HR20KBC,
	5215003	Semi-fixed
R401, R402	5215044 or	N08HR5KBC,
	5215020	Semi-fixed
R453	441521004	10 $\Omega$ , 1/2W, Metal oxide film
R901	441524794	0.47 $\Omega$ , 1/2W, Metal oxide film
R908	441721004	10 $\Omega$ , 2W, Metal oxide film
	Terminals	
P201	25045120	NPJ4PDBL49, Tape inpt/output
P202	25050064	NSCT-5P18, DI (G/W)
	Plugs	
P101, P401	25055045	NPLG-4P33
P402	25055038	NPLG-2P29
P705	25055133	NPLG-3P-117
	Socket	
P704A	2000321	NSAS-14P-280

### Power supply pc board (NAPS-2057)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q901	222780120	7812
	Transistors	
Q902	2201275 or	2SD772 (Q) or
	2201276	2SD772 (P)
Q903	2211454,	2SA1015 (GR),
	2212125 or	2SA1048 (GR) or
	2212495	JA101 (Q)
Q904	2201340 or	2SD1128 or
	2201350	2DS687
	Diodes	
D904	223105,	1S1555,
	223133,	DS442X,
	223145 or	1S2076TD or
	223150	US1040
D905	2239653,	RD13EB3,
	2242911 or	EQA02-13A or
	2243243	MTZ13C
	Capacitors	
C904	352783399	0.33 $\mu$ F, 50V, Elect.
C905, C906	352781099	0.1 $\mu$ F, 50V, Elect.
C907	352742219	220 $\mu$ F, 16V, Elect.
C908	352744709	47 $\mu$ F, 16V, Elect.
C924	352741019	100 $\mu$ F, 16V, Elect.
	Resistors	
R902, R903	441520224	2.2 $\Omega$ , 1/2W, Metal oxide film
	Radiator	
	27160075A	
	Spacers	
	223019	Transistor
	Bushing	
	223017	AC-310

### Meter LED pc board (NADIS-2058)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q305, Q306	222809	IR2E20
	Transistors	
Q307-Q310	2211554	2SA562TM (Y)
	LED array	
D305, D306	225091	GL-112M13
	Capacitor	
C351	352741009	10 $\mu$ F, 16V, Elect.

### Mic. amplifier pc board (NAMC-2059)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q207, Q208	22534,	NJM4559DX,
	222502 or	NJM4558DX or
	222811	NJM4588DD
	Capacitors	
C221, C222	392883397	0.33 $\mu$ F, 50V, 50V, LL
C223, C224	352780109	1 $\mu$ F, 50V, Elect.
	Terminal	
P203, P204	25045157	HJ-4337-01-3010, Mic.

### Tape monitor switch pc board (NASW-2060/a)

CIRCUIT NO.	PART NO.	DESCRIPTION
R239, R240	5104146	N09RL1KB25, Variable resistor
R451	5104147	N09RLCSK5B5, Variable resistor
S601	25035433	NPS-162-L397, Tape monitor switch
	27140911A	Bracket SW
	880009	Rivert
D601	2239673,	RD15EB3,
	2239691,	RD16EB1,
	2242922 or	EQA02-14B or
	2243253	MTZ15C (G/W)

### Main volume pc board (NAVR-2061)

CIRCUIT NO.	PART NO.	DESCRIPTION
R231, R232	6142034	N60LGL50KA10Z, Variable resistor

### Dolby switch pc board (NASW-2062)

CIRCUIT NO.	PART NO.	DESCRIPTION
S602-S604	25035379	NPS-322-L343, Push switch
P713	25055137	NPLG-7P-121, Plug

### Monitor indicator led pc board (NADIS-6073)

CIRCUIT NO.	PART NO.	DESCRIPTION
D602	225157	SEL1413E, LED
D603	225158	SEL1913K
	27190286A	Holder M

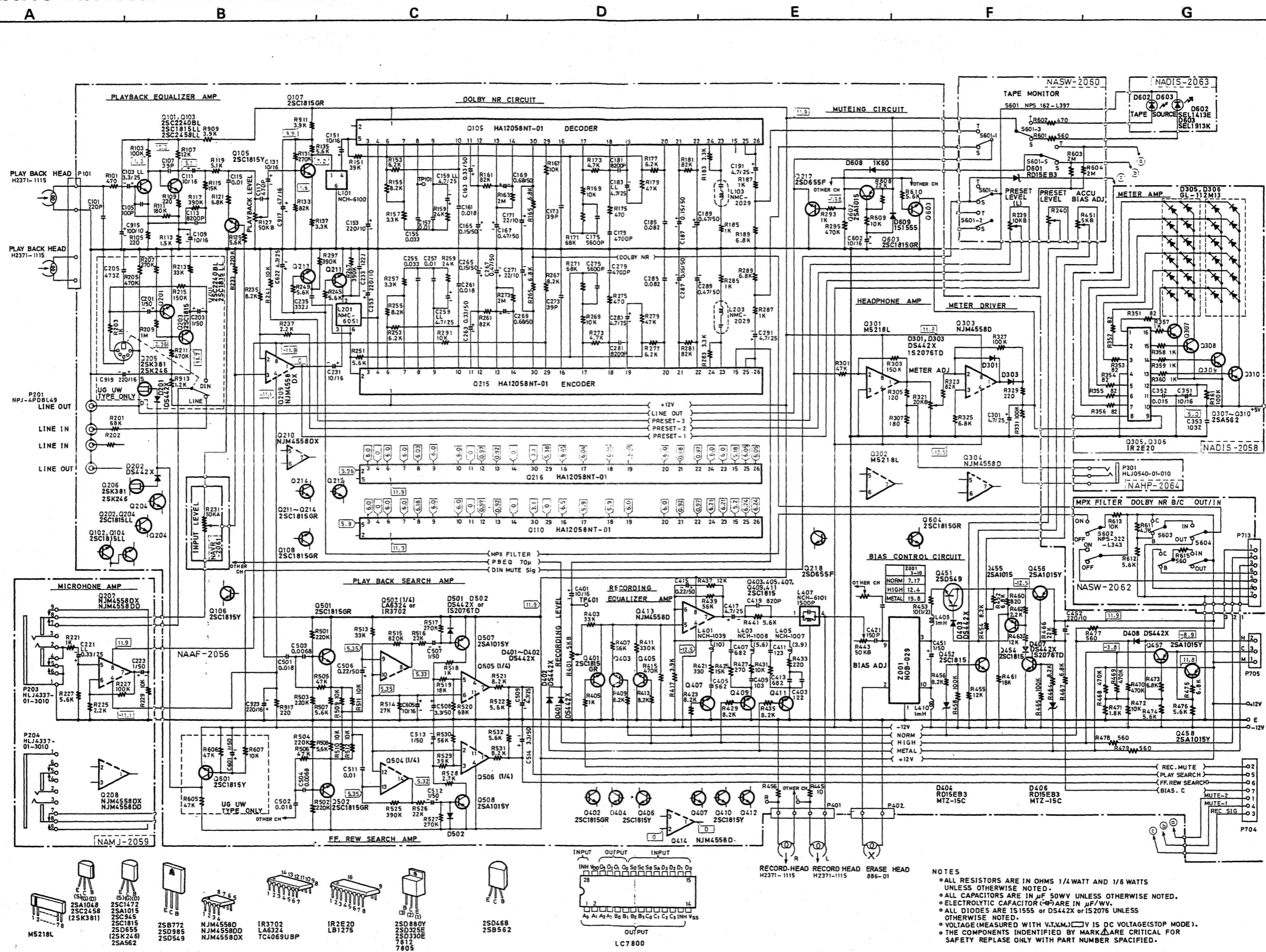
### Headphone terminal pc board (NAHP-2064)

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	HLJ0540-01-010, Headphone terminal

### Edge light pc board (NAPL-2065)

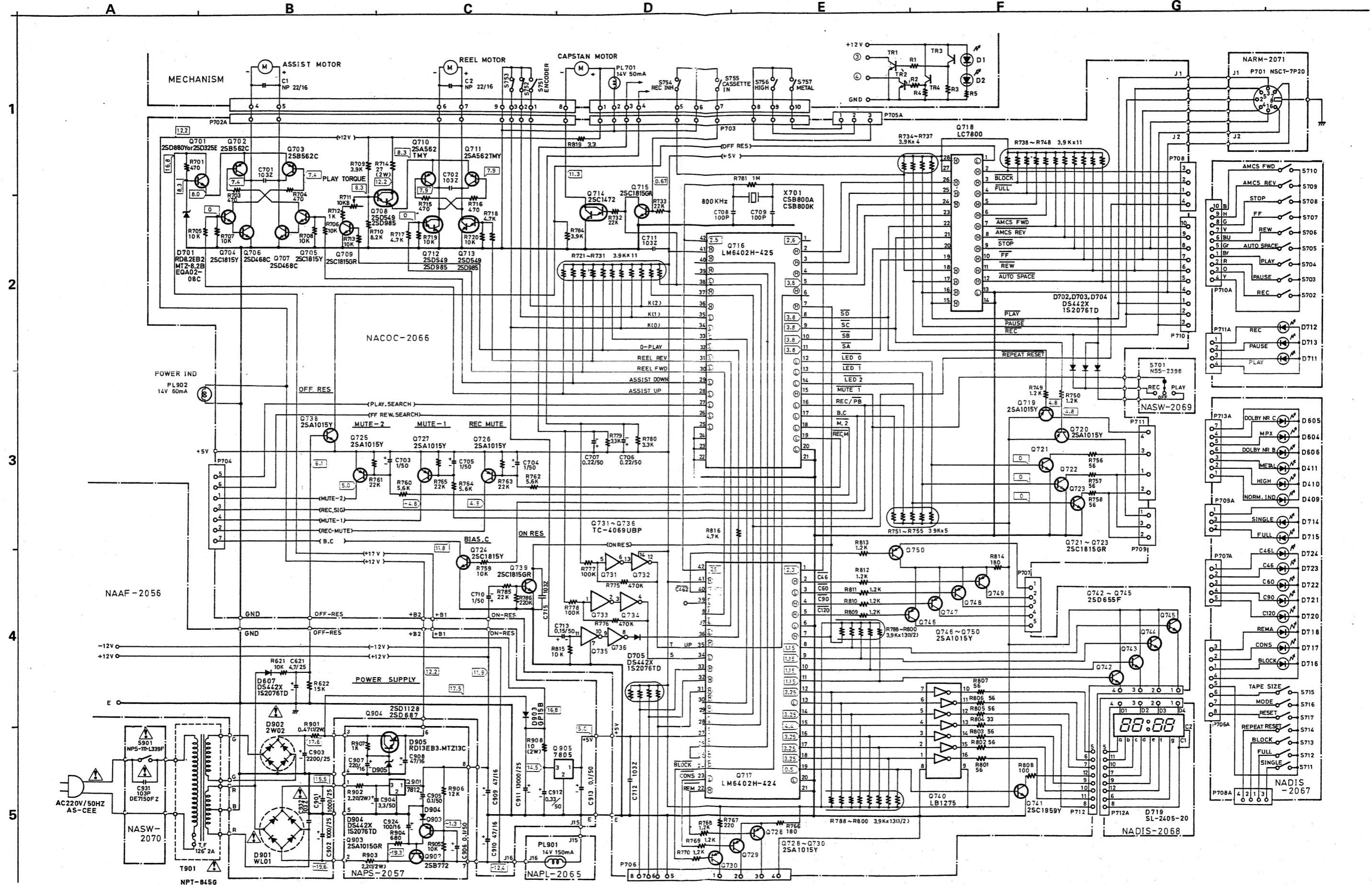
CIRCUIT NO.	PART NO.	DESCRIPTION
PL601	210090	PL14V150mA, Lamp

## SCHEMATIC DIAGRAM-AMPLIFIER SECTION

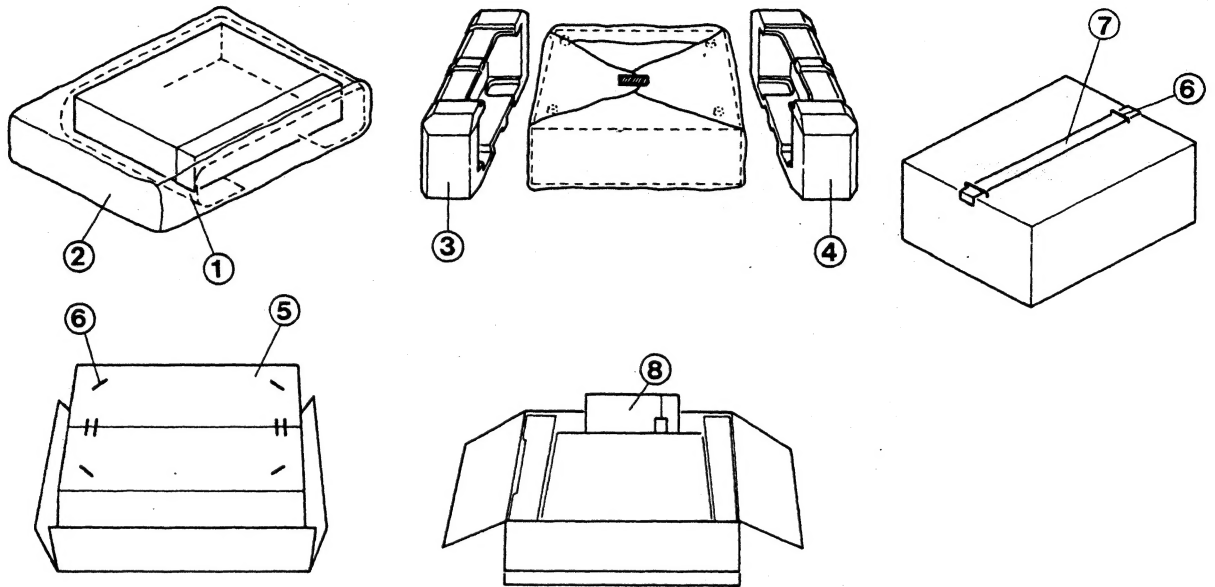


- NOTES
- ALL RESISTORS ARE IN OHMS 1/4 WATT AND 1/6 WATT UNLESS OTHERWISE NOTED.
  - ALL CAPACITORS ARE IN  $\mu$ F 50V UNLESS OTHERWISE NOTED.
  - ELECTROLYTIC CAPACITOR (P) ARE IN  $\mu$ F/VV.
  - ALL DIODES ARE 1S1555 OR DS442X OR 1S2076D UNLESS OTHERWISE NOTED.
  - VOLTAGE (MEASURED WITH V.T.M.)  $\square$  V IS DC VOLTAGE (STOP MODE).
  - THE COMPONENTS IDENTIFIED BY MARK  $\Delta$  ARE CRITICAL FOR SAFETY REPLACEMENT ONLY WITH PART NUMBER SPECIFIED.

## SCHEMATIC DIAGRAM-CONTROL SECTION



## PACKING VIEW



REF.NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500x800 Protection sheet(B)
2	290311A	500x750 Poly bag
3	29090770A	Pad(L)
4	29090769A	Pad(R)
5	29050978	Master carton box
	29050979	Master carton box(B)
6	282301	Sealing hook
7	260012	Dampson tape
8	Accesary bag ass'y	
	29340797	Instruction manual
	2010095	Connection cable
	25055040	
	29100005	220x330 Poly bag
	29365016	Waranty card